

Nurses' stress at work in COVID-19 pandemic

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Introduction

A recent paper published in *The Lancet* (2020) [1] called for high-quality research and studies on the mental health effects of the COVID-19 pandemic for the entire population as well as for the so-called "helping professions", including nursing staff. Research on the COVID-19 epidemiological situation focuses mainly on the incidence, prevention, diagnosis and treatment of the disease. Fewer studies look at the mental health problems of medical workers during the pandemic. Healthcare workers, including nurses of departments where patients in the most severe health condition are treated, face many factors that pose a threat to their physical and mental health. Physical loads, overtime work due to coworkers staying in quarantine etc., as well as the mental burden and chronic stress associated with working in a pandemic condition affect mental health and the effectiveness of nursing procedures. These experiences promote the occurrence of a variety of aversive psychological reactions. They can take the form of severe stress, depression or anxiety disorders. The role of decision-makers should be to take actions aimed at reducing the effects of this difficult situation. Protective measures to minimize the effects of chronic stress and prevent deterioration of mental health will contribute to ensure the long-term ability of nursing staff to work and provide high-quality medical services. Properly implemented prevention reduces the effects that may influence the mental health of medical staff for many years after the pandemic.

The aim of the literature review was to describe the main factors causing stress in the work of nursing staff during the coronavirus pandemic and to analyze the strategies of coping with stress used by nurses. Another goal set by the authors is to describe the consequences of chronic stress on medical workers and to emphasize the need to take targeted measures to minimize the effects of stress and its consequences for the health of nurses.

Methods

In the period following the peak of the COVID-19 pandemic, a detailed analysis of data from selected scientific databases was conducted. Research for scientific sources was conducted in bibliographic databases of peer-reviewed journals (Google Scholar, PubMed) to provide a broad view of the most recent. The criterion for the selection of literature was to search for key words: "nurse's work in COVID", "nurses stress management COVID", "nurses coping strategies COVID" and to analyze them in a global context. Only papers in English and Polish were included. After a detailed analysis of the available literature, the specificity of the work of nurses during a pandemic, the sources of stress as well as physical and mental stress in the current situation were described. The review included studies on the choice of coping strategies by nursing staff in the era of coronavirus.

Results/Discussion

At the end of 2019, the world heard the first information about the detection of the new SARS-Cov-2 coronavirus in China, in the city of Wuhan. In January 2020, the World Health Organization (WHO) announced that the outbreak caused by the novel coronavirus poses a threat on an international public health, as there is a high risk of the spread of the coronavirus disease around the world. In March 2020, COVID-19 was estimated to have reached the severity of a pandemic. WHO and public health authorities around the world have taken steps to stop the COVID-19 pandemic [2]. Initially, it seemed that the disease could be maintained in Southeast Asia, or that it would end with the arrival of spring. However, at the end of January 2020, cases of the disease began to appear in Europe. Initial cases were successfully controlled in Germany, France, Finland and Great Britain. The outbreak got out of control, first in Italy, then in Spain and France [3]. The situation of the rapidly increasing morbidity and the demand for hospital care showed the need to provide an adequate number of medical personnel, which became a global problem. Nurses are the largest occupational group in the health-care sector, accounting for roughly 59% of health professions, WHO reports. According to current data, there are almost 28 million nurses worldwide. According to the report, which took into account 191 countries and used data from years 2013 up to 2018, the greatest deficit of nurses is in low- to low-middle income countries in Africa, Southeast Asia, Eastern Mediterranean region and some parts of Latin America [4]. Additionally, demographic data show that nurses belong to the group of aging professions. The median age of a nurse today is 50 and 53% of working nurses are actually over the age of 50 [5]. Due to the average age, this group has an increased chance of being burdened with chronic diseases. Most SARS-CoV-2 infections are asymptomatic or mild, but the virus can also cause life-threatening pneumonia. Severe course of the COVID-19 disease is much more common in people over 50 years of age, burdened with: respiratory system diseases, cardiovascular diseases and metabolic diseases. The role of advanced age and comorbidities as the main risk factors for COVID-19 disease is associated with the weakening of immunity with the aging of the organism [6]. A review of nurses' health research shows that elevated blood pressure, risk of developing coronary heart disease, overweight and obesity are relatively common [7]. A cross-sectional study conducted in Hungary revealed that shift workers (especially women) lead a less healthy lifestyle and are at a higher risk of cardiovascular and metabolic diseases compared to those working only during the day [8]. These factors are identified as aggravating when having COVID-19 and may result in a greater number of complications and even an increase in mortality.

The pandemic situation showed how great is the demand of societies for nursing care, as well as how important is the participation of nurses in preventive, diagnostic and therapeutic activities. Modern nurses - educated people who make decisions about patients on their own and perform a number of services, must function every day in an epidemic threat and uncertainty related to the possibility of isolation from the family in the event of infection or infection of their loved ones. Mental stress, chronic stress related to the performance of work in conditions of constant danger affect mental health as well as the effectiveness of nursing procedures. The work of nurses has always been associated with constant time pressure, emergency and unpredictable situations as well as with the necessity to take quick actions and immediate decisions. In a pandemic

situation, these factors have an even greater impact on the mental condition of an employee. There are new, unknown and unpredictable situations, such as sudden deterioration of health of many patients requiring support for basic life functions, the need to undertake efficient resuscitation in the event of a lack of equipment or insufficient staff. It is necessary to have a high manual dexterity in the treatment and care activities. Each of these activities requires different abilities, predispositions and skills [9]. All these situations are a source of stress and lead to progressive fatigue, decrease in work efficiency and lower psychological comfort of nurses [10]. Before pandemic there were many areas that were a source of stress in nursing profession. Today, these situations represent an even greater aggravating factor. The stressors that working nurses face are similar in different departments, while the sources of stress are different [11].

Sources of stress in the work of nursing staff

- **Stress related to the workplace and its conditions** (organizational chaos and overload with professional duties, excess work, shifts, low pay - disproportionate to the effort, exposure to factors potentially harmful to physical and mental health),

- **Stress related to relationships with colleagues** (atmosphere in the therapeutic team, interpersonal relationships, conflicts among nurses and other members of the therapeutic team),

- **Stress related to the contact with the patient and their family** (too many patients, problems of the patient and their family resulting from the disease, exposure to serious infectious diseases (e.g. SARS-CoV-2 infection, HIV), professional problems resulting from working with aggressive, agitated, and dying patients [12].

There are many difficult and health-threatening situations in the work of nursing staff during a pandemic. It is worth emphasizing that not all people exposed to strong, negative effects of overload and stress or crisis situations will react in the same way. Individual mental resilience is an important protective factor. It has been shown that resilience, that is the ability of an individual to cope with adversity as a challenge, reduces the impact of traumatic events, reducing the likelihood of post-traumatic stress disorders [13]. Resilience can be understood as the process of positive adaptation to a stressful situation in which there is an interaction between personal resources and the environment. Resilience varies from person to person and also depends on several factors such as personality, interpersonal and social origin. Strategies to deal with the current pandemic that have been identified include optimism, social support, being up to date with credible information, avoiding information overload and maintaining online communication [14,15]. In healthcare professionals, a key factor in promoting resilience is increasing a sense of control over the unfavorable situation. For example, seeing that person can manage preventive measures, disease, or control one's ability to protect oneself with the resources available to healthcare professionals to look after infected patients are just some of the strategies that have been adopted during this pandemic. In similar emergencies, Such As The Acute Respiratory Syndrome (SARS) epidemic, nurses, who showed greater confidence in medical equipment, personal protective equipment and infection control presented lower level of anxiety, negative mood and emotional fatigue [16].

The aggravating situations include separation from the family,

unusual situations encountered in the course of performing professional duties, increased exposure to infection and fear of it, a sense of failure in the face of bad prognosis and insufficient technical resources to support patients [17-20]. It is difficult for health care workers to maintain mental health in these rapidly changing situations and to reduce the risk of depression, anxiety or burnout. Moreover, exposure to the feeling of chronic fear and anxiety in the situation of ethical challenges of the coronavirus pandemic such as work in conditions of insufficient equipment and human resources, the need to segregate patients depending on their health condition or chances of survival, inadequate palliative care and inability to allow the families to accompany dying patients are new situations that nursing staff have to deal with [21-23]. Healthcare professionals on the front line of fighting a pandemic need to receive help. There is a need to develop long-term strategies that include supporting the treatment team, monitoring their stress levels, encouraging self-care, taking regular breaks and remaining in contact with others who are experiencing the same situation. Data from China, Japan and Ethiopia showed that social and psychological interventions significantly improved the well-being and health of nursing staff during the COVID-19 outbreak [15,24,25].

Research among healthcare professionals in Spain indicated that 56.6% of workers had symptoms of Post-Traumatic Stress Disorder (PTSD). The number of people with possible anxiety disorders was 58.6%, and serious anxiety disorders were observed in 20.7%. Additionally, it was found that almost half of the respondents felt emotionally exhausted [26]. Currently published studies show that nurses show more symptoms of anxiety and depression [27]. It is the nursing staff that come into the closest and most frequent contact with infected patients. It is also indicated that there is a greater susceptibility to negative emotions due to gender and age. Women are more likely to experience anxiety, depression and are more prone to the symptoms of post-traumatic stress disorder [28]. Younger healthcare professionals show higher levels of post-traumatic stress and anxiety. This may be due to a lack of work experience in similar stressful situations. Another possible reason is that during the current pandemic, the lack of medical personnel forced medical graduates or those with less experience to be delegated to care for COVID-19 patients [29]. A factor which mentally aggravates nurses is the fear of infecting loved ones, family members, especially seniors. Often, health care workers have decided to change their place of residence due to a pandemic and to stay isolated from their family due to the possibility of infection. These factors, as confirmed by preliminary results of studies conducted in Poland and abroad, may contribute to intensification of psychological distress, including symptoms of depression and anxiety [30,31]. The study conducted in Hong Kong showed that nursing staff was found to be most prone to burnout, anxiety and mental exhaustion during pandemic [32,33]. The problem of anxiety, psychological issues and symptoms of post-traumatic anxiety disorder occur among healthcare professionals all around the world. In China, more than 40% of workers have psychological problems and 14.4% have PTSD symptoms. In the USA, high level of depression (43.3%), anxiety (45.4%) and PTSD symptoms (31.8%) were reported in young adult population. In Spain researchers proved that 18.7% workers had symptoms of depression, 21.6% presented symptoms of anxiety, and 15.8% PTSD symptoms. In Italian it was observed that 32.1% of workers had a high level of anxiety, 41.8% had a high stress level, and 7.6% had PTSD [34].

Arafa in the study of Egyptian nurses obtained similar results [35]. Hummel's study showed that participants from France and the United Kingdom reported they experienced severe / extremely severe depression, anxiety, and stress more often compared to those from the other countries [36]. There are also reports of suicides among health care workers who struggle with accumulated psychological pressure and intense fear of death [37].

Regular stress has an impact on the functioning of the body, which manifests itself in physical and mental problems. In stressful situations, the level of cortisol, called the stress hormone, increases, while the levels of serotonin and dopamine in brain decrease. These substances are responsible for the transmission of signals between neurons in the central nervous system - overloading this mechanism can have serious health consequences. Excessive amount of cortisol lowers the concentration of leukocytes in the blood and reduces the production of antibodies, therefore the exposure to infections, both viral and bacterial, increases [38]. During stressful situations, hormones such as adrenaline and noradrenaline are also released, which may have a short-term positive effect - but if stress is chronic, cardiovascular system becomes exposed to cardiovascular diseases, including, heart rhythm disturbances and hypertension. In addition, stress affects the sympathetic system - it increases the secretion of cytokines that can activate inflammatory processes in blood vessels and contribute to the development of atherosclerosis. It also influences lipid metabolism disorders, increasing cholesterol levels, and may predispose to the development of gastric and duodenal ulcers as a result of increased adrenaline production, adversely affecting the gastrointestinal mucosa [34]. Stress can induce a number of symptoms, such as abdominal pain, heartburn, nausea or diarrhea, and if it is experienced chronically, it can also cause irritable bowel syndrome. In some people, stress also manifests itself as headache, sleep disturbances, dehydration or skin lesions [39,40].

Long-term functioning in a stressful work environment has an impact on health and triggers the need to take specific actions, which are defined as strategies for coping with stress. Dealing with stress, according to the authors of the transactional theory of stress - Richard Lazarus and Susanne Folkman, is a constantly changing cognitive and behavioral effort, focused on specific external and internal struggles, assessed as overloading or exceeding human capabilities [41]. In order to cope with difficulties, a person may choose active methods of solving problems, treated as pro-health methods or avoidance strategies. The choice of a stress coping strategy largely depends on the perception and evaluation of oneself and one's own abilities in the context of a stressful situation [42]. In studies on the strategies of coping with stress by nurses during pandemic, Zhang (2020) estimated that nurses in Wuhan most often chose active strategies, especially Seeking Emotional Social Support coping strategy [43]. The study by Huang (2020) showed that nurses were proactive in applying problem-focused stress management [44]. Babore et al. (2020) assessed that among the group of 595 health care workers surveyed, the main protective factor was a positive attitude to a stressful situation, while female gender, seeking social support, avoidance strategies and working with COVID-19 patients were risk factors.

Economic status, the ability to solve problems and turning to religion were not related to the level of stress [45]. A large

Italian study by Vagni (2020) emphasizes that problem-focused coping strategies are most often used by men, while women tend to put particular emphasis on the emotional aspects of the situations they encounter [46].

Emotional overload may develop when there is no possibility or there are serious difficulties in developing effective ways of coping, especially in the absence of social support. This overload can manifest itself as anxiety and sadness, the form and intensity of which are similar to those of a clinically significant depression and / or anxiety disorder. In the case of people who are on the front lines of the fight against pandemic, the so-called Secondary Traumatic Stress (STS) may occur. It may have physical symptoms such as chronic fatigue, headache and mental symptoms - anxiety, guilt, withdrawal. In a situation where stress negatively affects the ability to perform professional tasks and the quality of patient care, it is worth seeking psychological or psychiatric help [30]. There is a need for research on the scale and severity of emotional distress, including symptoms of depression and generalized anxiety, in different countries. Conducting research on representative samples seems to be particularly helpful for the identification of risk groups, allowing to determine the intensity of emotional distress, especially among nursing staff working in wards treating patients with COVID-19, but also among staff working in other wards. At this difficult time, the World Health Organization emphasizes the decision-makers' care for the proper protection of the physical and mental health of health care workers. This prevention should apply to protective measures minimizing effects of chronic stress and protecting against the deterioration of mental health during current professional tasks. WHO points out that if the protection of physical and mental health is implemented, staff are able to perform their duties more efficiently. Good communication and providing all employees with accurate, up-to-date information reduces misinformation and stress [2]. In the study conducted by Hines (2021) it was empirically confirmed that a supportive workplace environment was related to lower moral injury whereas a stressful, less supportive environment was associated with increased moral injury. It is also recommended to use staff rotation, to shift employees from functions burdened with a high level of stress to less stressful tasks, as well as assigning less experienced people to cooperate with more experienced employees. The introduction of a partnership cooperation system provides support, allows to monitor the level of stress and strengthens safety procedures [47].

Limitations

The main limitations of the study are the bibliographic search was limitation only to specific key words. Other sources of search in future reviews could include oral communications in congresses and research projects in applied to nurses health and stress in health care profession. Furthermore, the choice of just two languages may narrow the global problem of stress in nurses' work in the COVID-19 pandemic.

Conclusion

Both government officials and policymakers in medical facilities should recognize that patient safety also includes safe working conditions for nurses. It is essential that personnel have personal protective equipment in the performance of their duties and that they implement appropriate preventive measures. Due to exposure to occupational risk factors during the pandemic, nurses become sick and unable to work. The result is the loss of employees, which is associated with the

deepening crisis of nursing shortage, the consequences of which could also be the deteriorating health of the population around the world. The task of the leaders should be providing information about the possibility of obtaining psychological support and mental health services. These efforts must be approached in the long term, only then will it be possible to ensure the long-term capacity of nurses to work and to reduce the effects on staff mental health that may remain for many years after the pandemic ends [2].

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